

AD _____

Award Number: W81XWH-05-2-0082

TITLE: Weight Measurements and Standards for Military Personnel

PRINCIPAL INVESTIGATOR: Donald A. Williamson, Ph.D.

CONTRACTING ORGANIZATION: Pennington Biomedical Research Center
Baton Rouge, LA 70808-4124

REPORT DATE: September 2008

TYPE OF REPORT: Final

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

DISTRIBUTION STATEMENT: Approved for Public Release;
Distribution Unlimited

The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision unless so designated by other documentation.

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE 01-09-2008		2. REPORT TYPE Final		3. DATES COVERED 15 Sep 2005 – 15 Aug 2008	
4. TITLE AND SUBTITLE Weight Measurements and Standards for Military Personnel				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER W81XWH-05-2-0082	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Donald A. Williamson, Ph.D. Email: williaDA@pbrc.edu				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Pennington Biomedical Research Center Baton Rouge, LA 70808-4124				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Medical Research and Materiel Command Fort Detrick, Maryland 21702-5012				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for Public Release; Distribution Unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT The purpose of this three-year study is to: 1) implement a computerized database to track the fatness and physical performance of Reservists assigned to the 94th RRC and 804th Medical Brigade, 2) provide the 94th RRC and 804th Medical Brigade with an environmental/internet-based intervention to increase health risk communication and promote healthy body weight/fatness and physical performance, 3) monitor the fatness and physical performance of the Reservists for two years following a one-year baseline period to evaluate the efficacy of the intervention, and 4) evaluate consumer satisfaction with the intervention.					
15. SUBJECT TERMS Nutrition, physical fitness, Soldiers, health, weight, body fat					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			USAMRMC
U	U	U	UU	17	19b. TELEPHONE NUMBER (include area code)

WEIGHT MEASUREMENTS AND STANDARDS FOR SOLDIERS

PENNINGTON BIOMEDICAL RESEARCH CENTER

Annual Report August 1, 2007-July 31, 2008

Table of Contents

	Page
Abstract	4
Introduction	5
Statement of Work	6
Project Deviations	8
Addenda	9

Abstract
Weight Measurements and Standards for Soldiers
(Contract # W81XWH-05-2-0082)

Keywords:

Readiness, performance, weight standards, fitness standards, internet intervention

Objective:

The purpose of this three-year study is to: 1) implement a computerized database to track the fatness and physical performance of Reservists assigned to the 94th RRC, 2) provide the 94th RRC with an environmental/internet-based intervention to increase health risk communication and promote healthy body weight/fatness and physical performance, 3) monitor the fatness and physical performance of the Reservists for two years following a one-year baseline period to evaluate the efficacy of the intervention, and 4) evaluate consumer satisfaction with the intervention. Hypothesis: It is hypothesized that implementation of the environmental/internet-based intervention will be associated with a significant increase in the percentage of Army Reservists who meet maximal body weight/fat and minimal fitness standards. Current plans are to complete the project by December 2010. Therefore this report describes progress made during that past year. A final report will be filed after completion of the study (December 2010).

Study Design:

This is a quasi-experimental study that utilizes a within-subjects or repeated measures design. Weight/fatness and physical performance data will be collected before and after the intervention is implemented.

Military Relevance:

The prevalence of overweight and obesity is increasing in the United States and Soldiers are not immune to this trend. At a significant cost to the military, 2705 Soldiers were discharged in FY03 for failure to meet body fat standards. Effective interventions to reduce body fat and increase physical performance among Soldiers will save the military financial and material resources and increase combat readiness.

Unlike clinic-based interventions, the proposed intervention will target an entire population of Reservists.

Public Purpose:

The intervention proposed in this project can serve as a pilot study and prototype for general use in the general population to reduce/prevent overweight.

Introduction

The primary aim of this investigation, entitled “Weight Measurement and Standards for Soldiers” was to provide a non-clinical, environmental approach for weight gain prevention and modest weight loss for Soldiers of the 94th Regional Readiness Command in the New England Region. This program is called “Healthy Eating, Activity, Lifestyle Training Headquarters (H.E.A.L.T.H.).” It is the second of two pilot studies being used to evaluate the efficacy and efficiency of a novel internet based approach to weight maintenance and weight loss.

Soldiers who fail to meet Army requirements for body fat defined by AR 600-9, the Army weight Control Program (AWCP), and fitness standards defined by FM 21-20, Physical Fitness Training, Army Physical Fitness Test (APFT) are the primary targets of the intervention. Soldiers with body weights that approach the maximal allowable weight as defined by AR 600-9 are also targets of the intervention.

In order to evaluate changes in body weight and body fat over time, the Military Services Fitness Database (MSFD) was developed. The MSFD records body weight, body composition, and APFT scores of Soldiers over long periods of time. The MSFD was intended to be initially implemented at Fort Bragg for the first of the two pilot studies. The MSFD was to be the database which measured the effectiveness of the environmental/Internet-based intervention (H.E.A.L.T.H.). Due to a series of decisions, the MSFD was not utilized for the purpose of measuring the outcome of the intervention. Nevertheless, the MSFD has been developed and tested in the field. The MSFD is one end product of the overall research project that remains available for delivery across all military services.

However, in regards to the 94th Regional Readiness Command; a similar database is in place that will provide the raw data for baseline measurement and extracted data over the course of the intervention. RLAS (Regional Level Application Software) data will be used to evaluate the H.E.A.L.T.H. intervention in the New England Region by allowing researchers to compare data that have been collected via the environmental/Internet-based program to those data that were collected and retrieved from the RLAS database. Also, a health promotion program was developed to publicize the existence of the website and encourage utilization by Soldiers and Family members of the 94th Regional Readiness Command. The health promotion program was implemented prior to the launch of the H.E.A.L.T.H. website and has been a constant health marketing program over the duration of the Internet-based program, i.e., two years. The research project was initiated in June 2007 and is planned to end in December of 2009. Due to a number of delays related to the War on Terror, the project will be extended until December 2010. A no-cost extension of the study was obtained in April 2009. The following sections provide details about accomplishments that are directly related to the Statement of Work.

Statement of Work

Weight Measurements and Standards for Soldiers

FY 07-08

Statement of Work (September, 2005)

- Overarching scope of work: Pennington Biomedical Research Center (PBRC) will collaborate with the US Army Research Institute of Environmental Medicine (USARIEM) and the US Army Medical Research and Materiel Command (USAMRMC) to implement a computer database to record and track the body weight/fatness and physical performance of Reservists assigned to the 94th Regional Readiness Command (RRC). The research team will assist in further developing an intervention designed to help service personnel achieve compliance with military body composition and physical performance standards.
- PBRC personnel will work closely with the Executive Committee (Donald Williamson, Ph.D., COL Karl Friedl, Ph.D., COL Gaston Bathalon, Ph.D., MAJ Lori Sigrist, Ph.D., Andrew Young, Ph.D., CAPT Van Hubbard, M.D., Ph.D., and Donna Ryan, M.D.) formed to guide this project.
- In Year 1, the PBRC team will deliver the Military Services Fitness Database (MSFD) to the 94th RRC. This computer database records and stores Soldiers' height/weight (body fat) and Army Physical Fitness Test (APFT) data. It can be used for all military services and meets the mandate of Department of Defense Instruction (DoDI) 1308.3 (2002) as a standardized method of collecting and storing Soldiers' fatness and physical performance data.
- Following delivery of the MSFD, 94th RRC personnel will be trained in its use, i.e., how to enter data and obtain reports on Reservists' body weight/fatness and fitness. The MSFD provides an easy way to obtain these valuable real-time readiness data.
- During Year 1, the MSFD will be used to collect baseline data. These data will consist of height/weight (fatness) and physical performance data, including whether or not the Reservist passed or failed fatness and physical performance standards.
- In collaboration with the 94th RRC leadership and USARIEM personnel (COL Bathalon, MAJ Sigrist), the PBRC research team will evaluate the unique health risk communication, weight management, and fitness needs of the Reservists assigned to the 94th RRC. This information will be used to modify an environmental/internet-based intervention to meet the needs of the 94th RRC. The intervention is designed to help Reservists achieve and maintain body weight/fatness and physical performance standards. Its content will be regularly reviewed by the Executive Committee and the 94th RRC leadership.
- During Year 2, the environmental/internet intervention will be implemented in the 94th RRC. This will be a two-year intervention (Years 2 and 3), consisting of a website designed to promote health risk communication and healthy body weight/fatness through healthy nutrition and physical activity. The intervention will be promoted and continuously modified to meet the needs of the 94th RRC Reservists.

- During Years 2 and 3, body fat and physical performance data will be collected. These and Year 1 data will be used to test the efficacy of the intervention. It is hypothesized that implementation of the intervention will be associated with a significant increase in the percentage of Army Reservists who meet body fat and physical performance standards.

A summary of progress toward meeting these milestones and objectives is provided in the Addenda.

Project Deviations

1. The Regional Level Application Software (RLAS) is an internal tracking system utilized by the Army Reserve. This system contains APFT and soldier information that would be contained in the MSFD. Therefore, the MSFD was not required and we decided to extract information from RLAS in January and July of each year.
2. Due to the schedule of APFT testing that is captured by RLAS, we will not analyze data that are collected during the launch period of the intervention, i.e., January 2007 to July 2007. This modification, plus the decision to collect two years of baseline data, will extend the intervention period to June 2009. Also, the Executive Committee and the Contract Officer, Andrew Young, Ph.D. have approved an additional year of follow-up. During this period the H.E.A.L.T.H. website will continue to be accessible to Reserve Soldiers, but the active health promotion program will be discontinued. Data from the website regarding utilization and self reported weight and APFT results will continue to be gathered during the one year period.
3. Data analysis and writing manuscripts will begin in July 2009 and extend to September 14, 2010.
4. The current study is a pilot study that is designed to provide preliminary data for planning a controlled outcome study to test the efficacy of the H.E.A.L.T.H. intervention for prevention of weight gain and reducing fatness and increasing fitness, as measured by the APFT. To accomplish this objective, during Years 3 and 4, a cluster (group) randomized trial to test the efficacy of the intervention using randomized controlled trial methodology will be developed.
5. Initial contact has been made with the Army Reserve of Louisiana. Major General Harry “Skip” Phillips provided us with support. However, it has become apparent that the Louisiana Army Reserve does not provide us with enough statistical strength to conduct a proper study. We have subsequently made contact and been granted approval and permission from the Louisiana Army National Guard to execute the randomized controlled study to the population of Louisiana Army Guard Soldiers.
6. During Years 4 and 5, baseline data on APFT results will be collected for the cluster (group) randomized trial.
7. In previous research for the Department of Defense, Dr. Williamson’s research team developed the digital photography method for measuring food intake and food selections. This line of research will be continued by developing and validating a semi-automated method for quantifying data derived from digital photography.
8. The official study period has been extended to December 31, 2010, which will allow the research team to complete the intervention period (June, 2009), complete the follow-up period (June, 2010), and analyze data and prepare manuscripts (December, 2010).

Addenda

Progress Report (August 1, 2007 –July 31, 2008)

Considerable progress related to the Statement of Work has been accomplished during the past year. This progress report provides an update on this progress and describes how this progress has resulted in several deviations from the original Statement of Work. These deviations are summarized in the section “Project Deviations.” As noted in the Project Deviation section, the end date for the project is December 31, 2010. This extended period of study will be conducted with no additional cost to the DoD (Department of Defense).

Executive Advisory Committee

The Executive Committee (Donald Williamson, Ph.D., COL Karl Friedl, Ph.D., COL Gaston Bathalon, Ph.D., LTC LesLee Sanders, PhD., Andrew Young, Ph.D., ADM Van Hubbard, M.D., Ph.D., and Donna Ryan, M.D.) guides the conduct of the study. The committee meets once or twice per year. During the last year, the committee convened in August of 2007 and will meet again in December 2008. Dr. Williamson briefed the contract officer, Dr. Andrew Young, and COL Gaston Bathalon on recent progress in April 2008.

Completed Travel Schedule (August, 2007-July, 2008)

Traveler	Destination	Date	Reason for Travel
Robert Newton	Boston/Devens	8/3/07 - 8/5/07	Website Promotion
Don Williamson	Boston/Devens	8/14/07 - 8/17/07	Site inspection for H.E.A.L.T.H. website
Matt McGucken	Boston/Devens	8/14/07 - 8/17/07	Follow-up visit for promotion of H.E.A.L.T.H. website
Don Williamson	Washington DC	8/21/07 - 8/23/07	Army Executive committee meeting
Ray Allen	Washington DC	8/21/07 - 8/23/07	Army Executive committee meeting
Tiffany Stewart	Washington DC	8/21/07 - 8/23/07	Army Executive committee meeting
Robert Newton	Washington DC	8/21/07 - 8/23/07	Army Executive committee meeting
Sandra May	Washington DC	8/21/07 - 8/23/07	Army Executive committee meeting
Matt McGucken	Washington DC	8/21/07 - 8/23/07	Army Executive committee meeting
Guy LaVergne	Washington DC	8/21/07 - 8/23/07	Army Executive committee meeting
Melanie Spinks	Washington DC	8/21/07 - 8/23/07	Army Executive committee meeting
Donna Ryan	Washington DC	8/21/07 - 8/23/07	Army Executive committee meeting
Megan Franklin	Washington DC	8/21/07 - 8/23/07	Army Executive committee meeting
Bob Spera	Washington DC	8/21/07 - 8/23/07	Army Executive committee meeting
Don Williamson	Boston/Devens	9/10/07 - 9/13/07	Interview for promotion coordinator position in New England
Matt McGucken	Boston/Devens	9/10/07 - 9/13/07	Interview for promotion coordinator position in New England
Robert Newton	Boston/Devens	9/10/07 - 9/13/07	Interview for promotion coordinator position in New England
Matt McGucken	Danvers/Andover	11/2/07 - 11/5/07	Follow-up visit for promotion of H.E.A.L.T.H. website
Matt McGucken	Devens	11/30/07 - 12/3/07	Follow-up visit for promotion of H.E.A.L.T.H. website
Robert Newton	Devens	2/28/08 - 3/2/08	Follow-up visit for promotion of H.E.A.L.T.H. website
Matt McGucken	Devens	2/28/08 - 3/2/08	Follow-up visit for promotion of H.E.A.L.T.H. website
Matt McGucken	Boston, MA	4/28/08 - 5/2/08	Progress brief for USARIEM

Don Williamson	Boston, MA	4/28/08 - 5/2/08	Progress brief for USARIEM
----------------	------------	------------------	----------------------------

RLAS and APFT data collection:

In February, 2008, we extracted APFT scores from the Regional Level Applications Software (RLAS). In the previous report, we provided data on the soldiers from January 1 to December 31st of 2006. We also provided a report on the findings of that extraction, which was the pre-website launch period. At that time there was a total of 4207 APFT records for 1253 different soldiers (85% men). RLAS data from July through December of 2007 was extracted in February, 2008. These data are presented below.

We have been able to obtain baseline data for two years (one more than specified in the Statement of Work) using the RLAS system. APFT data from these two years are summarized in Table 1. Data were collected on a total of 2686 Soldiers (2267 men and 419 women) with at least one APFT record in the RLAS system in 2005 or 2006. The average weight for men was just below the screening table weight, while the average weight for females was slightly above the weight standard. For the two-year period, 1016 (44.8%) men and 227 women (54.2%) failed the screening table weight at least once. An equal percentage of males (318, 14.0%) and females (62, 14.8%) failed the body fat standard at least once. The average APFT score for all Soldiers was 211.6, which is higher than the minimal APFT score (180). However, during this two-year period, 41% of Soldiers failed the APFT at least once.

We have also been able to obtain follow-up data from July 2007 through December of 2007. APFT data from this time period are summarized in Table 2. Data were collected on a total of 962 Soldiers (841 men and 121 women) with at least one APFT record in the RLAS system in the Fall of 2007. The average weight for men was about equal to the screening table weight, while the average weight for females was almost 5 lbs below the weight standard. In the Fall of 2007, 366 (43.5%) men and 39 women (32.2%) failed the screening table weight at least once. In addition, 106 (12.6%) men and 17 women (14.0%) failed the body fat standard at least once. The average APFT scores for all Soldiers was 212.4, which is higher than the minimal APFT score (180). However, the Fall 2007 data show that approximately 30% of Soldiers failed the APFT at least once. It is important to note that the screening table weights and the body fat taping standards were altered for females in 2007. This change became effective April 2, 2007 with the release of the new AR 600-9 regulations.

Table 1. 94th RRC APFT data extracted from RLAS in 2005 & 2006.

Sex	N Obs	Label	N	Mean	Std Dev	Minimum	Maximum
Male	2267	Age	2267	30.6	10.0	17.0	61.0
		Weight	2267	183.4	29.3	109.5	336.0
		Weight Deviation	2267	-1.7	24.3	-61.5	128.0
		FatPct	947	22.1	3.8	9.0	37.0
		%Fat Deviation	947	-1.3	3.5	-15.0	15.0
		APFT Total Score	2267	211.1	47.4	0.0	300.0
Female	419	Age	419	29.8	10.3	18.0	58.0
		Weight	419	144.5	23.3	97.0	220.7
		Weight Deviation	419	4.4	18.8	-40.0	68.0
		FatPct	205	31.3	4.0	17.0	44.0
		%Fat Deviation	205	-1.7	3.6	-13.0	11.0
		APFT Total Score	419	214.2	50.4	0.0	300.0

Table Note. Age in years; Weight in pounds; Weight deviation refers to the number of pounds from the Army screening table weight; FatPct in percent body fat; % Fat Deviation from Army body fat standard is the deviation from the maximal allowable fat estimate; APFT Total Score refers to APFT score units.

Table 2. 94th RRC APFT data extracted from RLAS in 2007.

Sex	N Obs	Label	N	Mean	Std Dev	Minimum	Maximum
Male	841	Age	841	31.9	9.6	19.0	60.0
		Weight	841	186.1	29.6	116.0	301.0
		Weight Deviation	841	0.6	25.4	-66.0	95.0
		Fat Pct	352	22.5	4.2	12.0	37.0
		%BF Deviation	352	-1.1	4.2	-12.0	14.0
		APFT Total Score	732	210.4	46.3	37.0	300.0
Female	121	Age	121	31.9	10.5	20.0	59.0
		Weight	121	144.1	20.5	103.0	202.0
		Weight Deviation	121	-4.8	18.7	-41.0	47.0
		Fat Pct	36	33.5	5.7	15.0	44.0
		%BF Deviation	36	-0.0	5.0	-17.0	10.0
		APFT Total Score	93	217.1	53.5	57.0	300.0

Table Note: Age in years; Weight in pounds; Weight deviation refers to the number of pounds from the Army screening table weight; FatPct in percent body fat; % Fat Deviation from Army body fat standard is the deviation from the maximal allowable fat estimate; APFT Total Score refers to APFT score units.

It is important to note that the previous data is not prospective; in other words, the 962 soldiers in the Fall of 2007 dataset are not necessarily included in the 2005-2006 dataset. Therefore, the data represent a cross-sectional analysis. However, it appears that the overall

percent of soldiers who are failing the standard table weight at least once and who fail the body fat taping is similar in both data sets. The percent of individuals failing the APFT is somewhat lower in the Fall 2007 data set. However, given the high rates of failure for the APFT (32-42%), there is great need for improvement. We hypothesize that the H.E.A.L.T.H. website intervention will decrease the number of Soldiers failing to meet standards specified by AR600-9.

H.E.A.L.T.H. website.

We have indicated that adaptations to the website would be an ongoing process. The goal is to continually make the website more user-friendly for reservists and Soldiers in general. Previous changes included adding an APFT calculator and APFT tracking resource. The adaptations also included printable history tracking charts, and a dashboard feature. The Dashboard feature provides a daily overview of the “my Meal Plan”, “my Workout Plan”, “my Lifestyle Goals”, and links to the other tools and sections of the HEALTH website. Additionally, a new tool, “my Energy Expenditure”, was developed and added which allows users to compare the number of calories ingested to the number of calories burned. The energy expenditure calorie numbers come from the users self-entered activities that can be selected from an exclusive listing.

These changes have occurred and are currently operating on the HEALTH website. The next sets of updates are currently scheduled to occur in late Fall 2008. Currently, we are working towards continuing to improve user-friendliness through modification of existing tools and user friendliness upon introduction to the site.

H.E.A.L.T.H. promotion program.

The goal is to promote the program and its use to Soldiers with in the 94th RRC (now the 655th and 302nd) In working with the G-6 of the 94th RRC we were able to place a link for the H.E.A.L.T.H. website on the official 94th RRC Intranet home page. This link enables 94th RRC network users to access the website from within a controlled domain without having to enter the URL. We have also acquired access to the 94th RRC’s SRP (Soldier Readiness Program) functions. At these functions H.E.A.L.T.H. representatives are a required stop for Soldiers who are participating in the SRP. This enables the H.E.A.L.T.H. representatives to register and inform all participating Soldiers about the needs and benefit of the H.E.A.L.T.H. website. It also provides PBRC a feedback resource.

We have continued to communicate with the 94th RRC command staff, commanders of individual units, soldiers, the 94th RRC family readiness group, and the PAO office. However, with the high operations and turnover tempo our promotion plan needed to be adjusted and led to the hiring of two new Field Coordinators. In August, 2007, PBRC hired two full time representatives, Mr John Lambert and Mr Jeff Wiggins.

Both of our new hires are prior service Army. Mr Lambert was a CW-4 within the 94th RRC and was stationed at Ft Devens, MA. Mr. Lambert was recently retired from an AGR position and provided us with a tremendous link between the 94th and PBRC. To date, Mr Lambert is PBRC’s representatives on all NE commanders’ calls and our first responder to all command initiated questions and directives. He also functions as a field representative for the HEALTH program and conducts trainings and briefings to members of the 94th RRC. Mr Jeff Wiggins was an E-5 with the A Co. 511th PIR at Ft Bragg, NC. He was released from active duty and was residing in the New England area when he was hired. Mr Wiggins provides us with a working knowledge of the Army structure as well as a knowledgeable resource for decision making in regard to promotion and communication activities. In addition to these attributes, Mr Wiggins functions as a field representative for the H.E.A.L.T.H. program and conducts trainings and briefings to members of the 94th RRC. Despite the fact that PBRC staff in NE have taken a more

proactive role in promotion, they continue to maintain regular contact with liaisons and work with them to disseminate the H.E.A.L.T.H. program.

To date, 58 of the 58 units (100%) that were in the 94th RRC's down-trace have been contacted regarding the H.E.A.L.T.H. website. It is estimated that 2600 of 2853 (91%) soldiers within the 94th RRC have been exposed to the website. This figure establishes that our goal of 100% unit contact, as stated in the previous report, has been accomplished. The remaining 8% of the soldiers under the 94th RRC will be exposed as the rotation from deployment continues.

Website utilization

As of August 12, 2008, 1271 soldiers have registered on the website. One hundred four soldiers have made 3 or more visits to the site, and 15 have made ten or more visits. From collected website data, the majority of the soldiers using H.E.A.L.T.H. are white (818, 73%). A significant majority of the population have a High School Degree (343, 31%), while the remainder of the population is dispersed across various categories including Grade School, 2-Year College Degree, 4-Year College Degree, Vocational Technical School, and Graduate School. Most soldiers who have registered on the website are combat support services (396, 36%) and have more than 10 years experience in the military. About ¼ of the registered users are of the NCO rank. The majority of persons who registered are Enlisted (379, 34%), while Officers who registered made up a significantly smaller population (95, 9%). These statistics are indicative of the traditional ratio of Officer to Enlisted in today's military establishment. To date, only 79 civilians have registered on the website. The primary reason for this low number is the fact that our promotion efforts are geared more towards making contact with soldiers rather than families.

We have engaged in a number of activities to register this number of soldiers, starting with a top-down approach. Our initial efforts were aimed at communicating with unit Commanders. With the Commander's blessing, we made contact with Training NCO's and First Sergeants who are responsible for interacting with the soldiers on the website. Simultaneously, we have attempted to communicate directly with the soldiers through face-to-face briefings and newsletters and other forms of E-mail communication sent through their units. Oftentimes, units conduct drill on the same weekend, allowing our staff to only meet with 2 units of an available 6-8 units gathering on any given weekend.

In an effort to facilitate regular usage, our field representatives have conducted interviews with approximately 15 NCO's and First Sergeants representing different units. The purpose of these interviews was to determine the ways in which the training officers were utilizing the website. Approximately 30% of the NCO's and First Sergeants indicated that they actually use the website with the soldiers on a repeat basis. Approximately 30% indicated that they require the soldier to have printed proof that they actually used the website. This would come in the form of the Certificate of Completion for a one-time visit and the weight graph or updated calendar for repeat usage. The remainder of the respondents indicated that they planned on using the website with soldiers in some capacity, either printed or face-to-face, in the near future. All of the training officers contacted indicated that they are only using the website with soldiers who are failing to meet the AR 600-9 standards. There was reluctance to use the website with soldiers who were passing the AR 600-9 and APFT due to time constraints. Our field representatives have planned to make return visits to all of these units to monitor their progress.

Additionally, we have developed a *Leader's Guide to Army H.E.A.L.T.H.* that is designed for military leaders. The guide will familiarize them with the website and its components, and provide structure for utilizing the website to assist soldiers in meeting the Army weight and fitness standards. The information provided in this guide will assist in establishing a health and fitness program following the guidelines of AR 600-9 and FM 21-20, as applicable. This

counseling guide is designed to be used in a time-limited setting that allows for the development of an individualized program to meet the specific health and fitness needs of the Soldier. The guide is designed to be used simultaneously with the website in the presence of the soldier, though it can also be used without the website in which the Soldier would have the responsibility to provide documentation of website utilization. The tools and information available in these resources can be used to improve soldier readiness by supplementing and expanding on weight management and fitness training. We have allowed several NCO's and First Sergeants to view prototypes of the Guide and we received positive and constructive feedback.

BRAC.

The Base Realignment and Closure (BRAC) has become a significant issue for the HEALTH study. To date, the transformation and realignment of assets and material from the 94th is almost 85% complete. Approximately 70% of the original soldiers in the 94th RRC will fall under the 655th RSC and the 302nd CSB. The 655th RSC (Regional Support Command) is a spin off of the 94th RRC will employ a significant number of the soldiers which previously fell under the 94th RRC. The 655th will fall in the down-trace of the 412th En Com (Engineering Command). The 302nd CSB (Combat Support Brigade), which will employ another significant portion of the soldiers which fell under the 94th RRC, will come under the command of the 316th ESC (Expeditionary Sustainment Command). The final step in the transformation, which will result in the dissolution of the 94th RRC, is expected to occur in September, 2008.

Steps have been taken to ensure minimal effects by the BRAC on the HEALTH promotion program. The steps taken include continued communication with key personnel, re-introduction of the HEALTH program to the new command structures, and attendance at monthly commanders conference calls of the 655th and 302nd. Additional efforts undertaken to prevent a negative effect of the BRAC are the continued identification of persons within the G-6 (655th and 302nd) that will assist with newsletter distribution and placement of the H.E.A.L.T.H. URL.

We have been able to obtain support from the Commanders of the 302nd and 655th. COL Falcone of the 655th RSC has pledged support for the HEALTH study its inception. He utilized a top-down approach to encourage his soldiers, provided suggestions for mass communication, and has allowed us to full access to his unit. COL Waters of the 302nd RSC has also utilized a top-down approach to encourage his soldiers and allowed us access to the soldiers that fall with in his general purview. Both commanders have provided us with access to commander's teleconferences, which allow us to stay a breast of the most recent changes in the realignment process, as well as giving us the ability to provide their staff with information regarding website usage statistics and user feedback.

Our efforts to communicate with soldiers within these 2 units appear to have been successful, as we have been able to reach 100% of the units in the 655th and 302nd. In addition, our health promotion efforts were conducted in all of the 655th and 302nd, as well as the 94th units. Furthermore, the Fall of 2007 RLAS data extraction contained data from all units within the 655th and 302nd. Approximately 44% of the soldiers in the Fall 2007 RLAS extraction were from the 655th, 40% were derived from the 302nd, and 16% were derived from the 94th RRC. These numbers align closely with our previous estimates that 70% of the soldiers originally in the 94th RRC will become a part of either the 655th or 302nd commands. Thus, we have been able to communicate and track 94th soldiers whom matriculated to either the 302nd or 655th.

Future Plans

We are currently in the beginning stages of planning for a cluster (group) randomized trial in Louisiana, in which we will deliver the H.E.A.L.T.H. intervention to the Louisiana Army National Guard. We have received initial buy-in from the Louisiana Army National Guard

(LAANG), which provides us with an opportunity to present the goals, strategies, and action plan of the proposed study to the Louisiana Army National Guard leadership. On June 18, 2008 a meeting was held in Pineville, LA with Brigadier General Glen Curtis and his staff to establish the foundation of the LAANG's interest in participating in the proposed study. As of August 12, 2008, a final decision on full cooperation by the LAANG in regards to this study has yet to be made. Preliminary discussions have resulted in positive feedback from Brigadier General Curtis' office. However, The Adjutant General of the Louisiana National Guard (Major General Bennet C. Landreneau) has taken a personal interest in the program and has ordered a comprehensive review of the HEALTH study and its potential impact on the population of the LAANG. In support of the proposed study, members of the LAANG medical community are vocally supportive and understand the potential that this proposed study has to the Army as a whole. Currently, we plan to initiate this cluster randomized trial during 2009, possibly beginning some time between July and December, 2009. The protocol for this study has been prepared and the research design has been approved by the contract officer and the protocol will be reviewed by the Executive Committee in December, 2008. We plan to submit the protocol for IRB review in the next few months.

We are also continuing our earlier DOD research related to developing reliable and valid measures of food intake and food selections of humans. Originally, this method was called the digital photography method and it was developed by Dr. Donald Williamson. This reliable method (references 1-5) was pioneered for use with Basic Combat Soldiers at Ft Jackson. Dr. Corby Martin has expanded on this technology and has developed the Remote Food Photography Method (RFPM) for use in free-living conditions. When using the RFPM, participants take photographs of their food selection and plate waste with a camera-enabled cell phone and these images are sent to the research center for analysis in real-time. Dr. Martin currently has an article in press [6] regarding this advanced engineering and imaging system. Additionally, a test of the RFPM method in free-living conditions over 7 days using two forms of Ecological Momentary Assessment (EMA) methodology has been completed. Dr. Martin tested EMA methods in association with the RFPM to ensure data quality and completeness. The criterion measure of energy intake was the "gold standard", doubly labeled water. This study is complete and will be submitted for publication soon.

Currently, Dr. Martin is executing the next phase of the research, which includes development of semi-automated computer applications to collect and analyze RFPM data. The resulting RFPM system will be able to identify/categorize foods and calculate the amount of food present in the photographs. This research will culminate in a stringent test of the methodology over seven days in free-living conditions, and, ultimately, we plan to test the validity of this method for measuring the food intake of Soldiers.

Summary

The primary task for the next year is to develop continued use from the Soldiers who have registered an account on the Army H.E.A.L.T.H. website. We will continue to promote the website utilizing PBRC staff and technology to the Soldiers in NE that were identified as being part of the original 94th RRC population. We will continue to collect RLAS data and will be able to have reportable data in subsequent reports. For future reference, the extraction of RLAS/APFT data will occur bi-annually (April through May and September and October), similar to the Fall 2007 extraction. Website adaptation will continue throughout the duration of the program. Improvements to functionality, user friendliness, and region specific topics will be continually observed and updated.

We have begun planning for the cluster randomization study that was described in the application for funding (Weight Measurements and Standards for Soldiers--- Contract #

W81XWH-05-2-0082). We have identified the Louisiana Army National Guard as an acceptable test population and are in communication with representatives from the LAANG, which will allow for the execution of the follow-on study. The beginning of the randomized controlled study in Louisiana among a population of National Guard Soldiers is currently scheduled to occur in the beginning months of 2009.

Additionally, continued funding of this project will support the efforts of Dr. Corby Martin and his advancements with RFPM assessment of food intake. Ultimately, we plan to test the validity of this method for measuring food intake of Soldiers.

References related to the Digital Photography Method

1. Williamson, D.A., Martin, P.D., Allen, H.R., Most, M.M., Alfonso, A.J., Thomas, V, & Ryan, D.H. Changes in food intake and body weight associated with Basic Combat Training. *Military Medicine*, 167: 248-253, 2002.
2. Williamson, D.A., Allen, H.R., Martin, P.D., Alfonso, A.J., Gerald, B. & Hunt A. Use of digital photography to measure food portion sizes. *Journal of the American Dietetic Association*, 103: 1139-1145, 2003.
3. Williamson, D.A., Allen, H.R., Martin, P.D., Alfonso, A.J., Gerald, B. & Hunt A. Digital photography: A new method for estimating food intake in cafeteria settings. *Eating and Weight Disorders*, 9: 24-28, 2004.
4. Martin, C.K., Newton, R.L., Anton, S.D., Allen, H.R., Alfonso, A., Han, H., Stewart, T., Sothorn, M., & Williamson, D.A. Measurement of children's food intake with digital photography and the effects of second servings upon food intake. *Eating Behaviors*, 8, 148-156, 2007.
5. Williamson, D.A., Copeland, A.L., Anton, S.D., Champagne, D., Han, H., Lewis, L., Martin, C., Newton, R.L., Sothorn, M., Stewart, T., & Ryan, D. Wise Mind Project: A school-based environmental approach for preventing weight gain in children. *Obesity*, 15, 906-917, 2007.
6. Martin, C., Han, H., Coulon, S., Allen, H., & Anton, S. (2008). The Remote Food Photography Method: An innovative method to measure the food intake of free-living people. [Abstract]. *International Journal of Obesity* 32 (Suppl. 1), S201.